

WHAT IS CLAIMED IS:

1 1. A CDMA receiver capable of detecting a pilot channel
2 signal having a known pseudo-random noise (PN) chip sequence, said
3 known PN chip sequence comprising a plurality of known Logic 1
4 chips and a plurality of known Logic 0 chips, said CDMA receiver
5 comprising:

6 a memory capable of storing said pilot channel signal as
7 a first original sequence of chip samples;

8 a pseudo-signal generator capable of re-ordering selected
9 ones of said first original sequence of chip samples to thereby
10 generate a first re-ordered sequence of chip samples, wherein said
11 pseudo-signal generator combines said original sequence of chip
12 samples with said first re-ordered sequence of chip samples to
13 thereby generate a first pseudo-signal sequence of combined chip
14 samples;

15 a first matched filter capable of computing a first
16 correlation value indicating a relative correlation between said
17 first pseudo-signal sequence of combined chip samples and said
18 known PN chip sequence; and

19 a decision circuit capable of determining from said first
20 correlation value if said pilot channel signal has been detected.

1 2. The CDMA receiver as set forth in Claim 1 wherein said
2 pseudo-signal generator is further capable of re-ordering selected
3 ones of said original sequence of chip samples to thereby generate
4 a second re-ordered sequence of chip samples, wherein said pseudo
5 signal generator combines said first pseudo-signal sequence of
6 combined chip samples with said second re-ordered sequence of chip
7 samples to thereby generate a second pseudo-signal sequence of
8 combined chip samples.

1 3. The CDMA receiver as set forth in Claim 2 wherein said
2 first matched filter computes a second correlation value indicating
3 a relative correlation between said second pseudo-signal sequence
4 of combined chip samples and said known PN chip sequence.

1 4. The CDMA receiver as set forth in Claim 3 wherein said
2 decision circuit determines from said second correlation value if
3 said pilot channel signal has been detected.

1 5. The CDMA receiver as set forth in Claim 1 wherein said
2 pseudo-signal generator generates from said first original sequence
3 of chip samples a first time-shifted original sequence of chip
4 samples and re-orders selected ones of said first time-shifted
5 original sequence of chip samples to thereby generate a first
6 time-shifted re-ordered sequence of chip samples, wherein said
7 pseudo-signal generator combines said first time-shifted original
8 sequence of chip samples with said first time-shifted re-ordered
9 sequence of chip samples to thereby generate a first time-shifted
10 pseudo-signal sequence of combined chip samples.

1 6. The CDMA receiver as set forth in Claim 5 further
2 comprising a second matched filter capable of computing a second
3 correlation value indicating a relative correlation between said
4 first time-shifted pseudo-signal sequence of combined chip samples
5 and said known PN chip sequence.

1 7. The CDMA receiver as set forth in Claim 6 wherein said
2 decision circuit determines from said second correlation value if
3 said pilot channel signal has been detected.

1 8. The CDMA receiver as set forth in Claim 1 wherein said
2 pseudo-signal generator re-orders said selected ones of said first
3 original sequence of chip samples by 1) determining a first
4 plurality of time slots, each of said first plurality of time slots
5 comprising a plurality of chip samples corresponding to Logic 1
6 chips, and a second plurality of time slots, each of said second
7 plurality of time slots comprising a plurality of chip samples
8 corresponding to Logic 0 chips, and 2) at least one of: a)
9 modifying an order of a first Logic 1 chip sample and a second
10 Logic 1 chip sample; and b) modifying an order of a first Logic 0
11 chip sample and a second Logic 0 chip sample.

1 9. The CDMA receiver as set forth in Claim 1 wherein said
2 CDMA receiver is disposed in a wireless mobile station comprising
3 one of a cellular telephone, a paging device, a wireless network
4 card, and their equivalents.

1 10. The CDMA receiver as set forth in Claim 1 wherein said
2 CDMA receiver is disposed in a fixed access terminal.

1 11. A wireless mobile station capable of communicating with
2 a plurality of base stations in a wireless network, said wireless
3 mobile station comprising a CDMA receiver capable of detecting a
4 pilot channel signal having a known pseudo-random noise (PN) chip
5 sequence, said known PN chip sequence comprising a plurality of
6 known Logic 1 chips and a plurality of known Logic 0 chips, said
7 CDMA receiver comprising:

8 a memory capable of storing said pilot channel signal as
9 a first original sequence of chip samples;

10 a pseudo-signal generator capable of re-ordering selected
11 ones of said first original sequence of chip samples to thereby
12 generate a first re-ordered sequence of chip samples, wherein said
13 pseudo-signal generator combines said original sequence of chip
14 samples with said first re-ordered sequence of chip samples to
15 thereby generate a first pseudo-signal sequence of combined chip
16 samples;

17 a first matched filter capable of computing a first
18 correlation value indicating a relative correlation between said
19 first pseudo-signal sequence of combined chip samples and said
20 known PN chip sequence; and

21 a decision circuit capable of determining from said first
22 correlation value if said pilot channel signal has been detected.

1 12. The wireless mobile station as set forth in Claim 11
2 wherein said pseudo-signal generator is further capable of
3 re-ordering selected ones of said original sequence of chip samples
4 to thereby generate a second re-ordered sequence of chip samples,
5 wherein said pseudo signal generator combines said first
6 pseudo-signal sequence of combined chip samples with said second
7 re-ordered sequence of chip samples to thereby generate a second
8 pseudo-signal sequence of combined chip samples.

1 13. The wireless mobile station as set forth in Claim 12
2 wherein said first matched filter computes a second correlation
3 value indicating a relative correlation between said second
4 pseudo-signal sequence of combined chip samples and said known PN
5 chip sequence.

1 14. The wireless mobile station as set forth in Claim 13
2 wherein said decision circuit determines from said second
3 correlation value if said pilot channel signal has been detected.

1 15. The wireless mobile station as set forth in Claim 11
2 wherein said pseudo-signal generator generates from said first
3 original sequence of chip samples a first time-shifted original
4 sequence of chip samples and re-orders selected ones of said first
5 time-shifted original sequence of chip samples to thereby generate
6 a first time-shifted re-ordered sequence of chip samples, wherein
7 said pseudo-signal generator combines said first time-shifted
8 original sequence of chip samples with said first time-shifted
9 re-ordered sequence of chip samples to thereby generate a first
10 time-shifted pseudo-signal sequence of combined chip samples.

1 16. The wireless mobile station as set forth in Claim 15
2 further comprising a second matched filter capable of computing a
3 second correlation value indicating a relative correlation between
4 said first time-shifted pseudo-signal sequence of combined chip
5 samples and said known PN chip sequence.

1 17. The wireless mobile station as set forth in Claim 16
2 wherein said decision circuit determines from said second
3 correlation value if said pilot channel signal has been detected.

1 18. The wireless mobile station as set forth in Claim 11
2 wherein said pseudo-signal generator re-orders said selected ones
3 of said first original sequence of chip samples by 1) determining
4 a first plurality of time slots, each of said first plurality of
5 time slots comprising a plurality of chip samples corresponding to
6 Logic 1 chips, and a second plurality of time slots, each of said
7 second plurality of time slots comprising a plurality of chip
8 samples corresponding to Logic 0 chips, and 2) at least one of: a)
9 modifying an order of a first Logic 1 chip sample and a second
10 Logic 1 chip sample; and b) modifying an order of a first Logic 0
11 chip sample and a second Logic 0 chip sample.

1 19. The wireless mobile station as set forth in Claim 11
2 wherein said wireless mobile station comprises one of a cellular
3 telephone, a paging device, a wireless network card, and their
4 equivalents.

1 20. A method of detecting a pilot channel signal having a
2 known pseudo-random noise (PN) chip sequence, the known PN chip
3 sequence comprising a plurality of known Logic 1 chips and a
4 plurality of known Logic 0 chips, the method comprising the steps
5 of:

6 storing the pilot channel signal as a first original
7 sequence of chip samples;

8 re-ordering selected ones of the first original sequence
9 of chip samples to thereby generate a first re-ordered sequence of
10 chip samples;

11 combining the original sequence of chip samples with the
12 first re-ordered sequence of chip samples to thereby generate a
13 first pseudo-signal sequence of combined chip samples;

14 computing a first correlation value indicating a relative
15 correlation between the first pseudo-signal sequence of combined
16 chip samples and the known PN chip sequence; and

17 determining from the first correlation value if the pilot
18 channel signal has been detected.